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ABSTRACT

Research was reviewed to identify the characteristics of effective university and college-based programs for educating prospective teachers. Programs were considered effective to the extent that they enhanced the capability of teachers to contribute to student learning. The research reviewed was almost exclusively concerned with the learning of traditional academic subjects, and three types of studies were the focus of the review: (1) studies of the effects of teacher preparation programs on student performance or on teacher behavior; (2) studies of teacher characteristics related to student achievement; and (3) research on effective teaching. The report is built around the following specific issues: (1) teacher preparation programs' ability to teach teachers to teach effectively; (2) overall effects of teacher preparation programs; (3) ability of teacher education programs to teach instructional strategies; (4) admission standards for teacher education programs and for entry into the profession; (4) (5) content of teacher education programs; (6) subject matter expertise and teacher effectiveness; (7) the pedagogy of teaching to teach; and (8) the induction phase of teacher learning. Conclusions drawn from the findings are discussed. (CB)

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THE CHARACTERISTICS OF EFFECTIVE TEACHER PREPARATION PROGRAMS: A REVIEW OF RESEARCH

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Introduction

Purpose of the Report

This report seeks to identify the characteristics of effective university and college-based programs for educating prospective teachers. For our purposes, programs are effective to the extent that they enhance the capability of teachers to contribute to student learning. The research on which this study is based focuses almost exclusively on the learning of traditional academic subjects. We do not deal with other possible objectives of teacher preparation, such as the enrichment of teachers' learning for its own sake or the development of nonacademic abilities and interests among students.

If the conclusions reached in this report are valid, one should be able to use them either to differentiate teacher education programs in terms of their effectiveness or to specify goals for the improvement of preservice teacher education.

The Research Reviewed

More than 20 years ago, Sarason, Davidson, and Blatt (1962) observed that the preparation of teaching was "an unstudied problem." Relative to other potential influences on student learning in schools, this characterization is still correct. Indeed, our review of empirical research on preservice teacher education suggests that the number of studies of teacher preparation may actually be lower in the last ten years or so than in each of the previous two decades.

There is a mountain of words written about teacher education. Most of these words manifest criticism, description, prescription, and exhortation. It is commonplace to say that research on important topics related to

education is limited but limited is too fulsome a way to describe the empirical research on teacher preparation. Not only is the body of research small, it is methodologically and theoretically anemic. For example, the sample size is often small, both dependent and independent variables are seldom well defined or fully specified, and analyses seldom control for potentially important interactive effects of related independent variables.

In this analysis we focus on three types of studies though we draw on other research as appropriate.

1. Studies of the effects of teacher preparation programs on student performance or on teacher behavior that have been found in other research to foster student learning.

2. Studies of teacher characteristics related to student achievement that might be learned or tested for in teacher preparation programs.

3. Research on effective teaching. This research is examined on the premise that preservice teachers should learn about those behaviors and practices that are most likely to promote student learning.

While many of the first two types of studies are weak, we use what there is if the studies:

1. are longitudinal and/or involve comparisons of different ways of educating teachers, and

2. relate what prospective teachers are taught, how they are taught, or teacher characteristics, either to measures of student performance, comparative rating of teacher behavior by principals, other teachers, or independent observers.

These constraints substantially limit the pool of studies examined.

Overview

This report is structured around a series of questions that represent key decisions relating to the way teachers are prepared in the United States. The first two of these address the fundamental issue of whether we need formal programs of teacher preparation at all. Since the answer to

these questions seems to be affirmative, the report turns to the criteria for entry and successful exit from teacher preparation programs. The content and pattern of undergraduate education most likely to produce effective teachers are explored as is the limited evidence on particular ways to teach or facilitate the learning of the things neophyte teachers should know and be able to do.

Some implications of the research reviewed for the content and structure of teacher preparation programs are spelled out in the conclusion of the report.

Our purpose is <u>not</u> to prescribe a full blown strategy for teacher preparation but to suggest which elements of teacher education can be justified by research. In general, we do not stray far from paths defined by empirical evidence. There are two exceptions to this groundrule. First, we draw attention to the probability that if the so-called induction period--the first one or two years of teaching--were seen as an integral part of teacher preparation, the quality of teaching in our schools would be greater. Second, we briefly discuss the probable importance of providing would-be teachers with greater analytical and problem solving skills than they usually gain in college.

We focus attention on undergraduate teacher preparation because that is the entry route to the profession that most teachers use and because there appears to be absolutely no comparative research on the efficacy of post-baccalaureate teacher preparation. We see no reason, however, why the lessons one can learn from the research discussed here would not be relevant to extended or "fifth-year" programs for preparing teachers.

Can Teacher Preparation Programs Teach Teachers to Teach Effectively?

If college and university based preservice education of teachers did not improve the contributions teachers make to student learning, reforming teacher education would make less sense than abandoning the general approach now in use in favor of some radically different way of providing entry to the teaching profession.

There are two types of studies that might speak to the question: does teacher education make a difference? The first of these involves comparisons on the effectiveness of teachers who participate in teacher education programs with the effectiveness of teachers who have no or much less formal preservice preparation. The second body of research that seems relevant are studies of efforts to teach preservice teachers particular ways of improving instructional practices.

The Overall Effects of Teacher Preparation Programs

Though teacher preparation programs are often blamed for unleashing poorly educated instructors upon the nation's children, students preparing for a career in secondary education frequently are required to take less than one-fourth of their coursework in education and those preparing to be elementary teachers must take about one-third of their courses in education (Smith & Street, 1980). Moreover, it appears that universities spend only about two-thirds of what it costs to educate the average public school student to prepare the average teacher (Peaseau & Orr, 1980). This reality has caused some observers to characterize teacher preparation as a limited intervention which, even if it were conducted much better than it usually is, could be expected to have a very limited effect (cf. Lanier, 1984; Kerr, 1983).

To determine the effects of teacher preparation programs on teacher competence, most researchers have compared the performance of regularly and provisionally certified teachers. Provisionally certified teachers, depending on the state, may have little or no formal preparation or may be required to have made considerable progress toward satisfying the regular requirements for certification. Thus, the education courses and practical experiences of "provisional teachers" differ substantially within and among studies and few studies explicitly take this into account.

Nonetheless, comparing provisionally certified and regularly certified teachers provides the best way we have of assessing the overall effects of existing strategies for preservice teacher education on teacher performance.

We found thirteen studies that compared regularly and provisionally certified teachers. Four of these deal directly with student achievement (Hall, 1962; Denton & Lacina, 1984; Taylor, 1957; Shim, 1965). The others use various formal rating systems administered by principals and/or trained observers to assess teacher performance (Gray, 1962; LuPone, 1961; Gerlock, 1964; Copley, 1974; Bledsoe, Cox, & Burnham, 1967; Beery, 1960; Massey & Vineyard, 1958; and two studies by Cornett, 1984).

In all but two of these studies, regularly certified teachers were ranked higher than were teachers with less formal training. Shim (1965) studied 89 elementary school teachers and found that the students taught by the uncertified teachers scored higher on tests of academic achievement. Shim also found that the students of teachers with lower grade point averages tested better than students of teachers with higher grade point averages. Cornett (1984) compared principal's rankings of provisionally certified and regularly certified teachers in North Carolina and found no

difference. Few of the teachers studied were ranked below the satisfactory level and inexperienced and experienced teachers were ranked equally well.

The studies suggesting that teacher education improves teacher performance cover both elementary and secondary teachers. The strength of the differences between the performance of regularly and certified teachers is more often than not small but statistically significant. The size of the teacher education program effect is difficult to assess, however, because the rating scales used are not normed and there is usually relatively little variation in the ratings.

This is not, as indicated earlier, a strong body of research. For example, most studies comparing teachers prepared through education courses and those not so trained do not seek to control for differences in the intelligence or general academic competence of the teachers. However, it seems unlikely, given the generally lower academic aptitude of would-be teachers (cf. Schlechty & Vance, 1983; Weaver, 1979), that the greater perceived effectiveness of teachers prepared in formal certification programs could be attributed to their superior intelligence. Indeed, one who was sympathetic to schools or departments of education might surmise to the extent that intelligence is related to teacher performance, professional preparation more than compensates for the intellectual deficits of teachers.* This is not to say, of course, that children would not be better off if they had professionally trained teachers who were more academically competent. However, as we note below, the significance of teachers' academic performance for their classroom effectiveness is less clear than one might intuitively expect.

*The relatively low test scores of techers as compared to other professionals is a phenomenon of long standing (cf. Kerr, 1983).

Other background or context variables that might account for differences in teacher effectiveness are infrequently accounted for in selecting samples or analyzing data. For example, in a recent study (that was misreported in the national press), Cornett (1984) compared principals' ranking of a small sample of regularly and provisionally certified teachers teaching in an urban Georgia school system. The regularly certified teachers were judged substantially more competent than the teachers with less professional training but they also were more experienced.

Evaluation of teacher expertise is an imprecise process. Some scholars believe that there is little evidence that supervisors' evaluations actually predict teachers' ability to foster student achievement (Soar, Medley, & Coker, 1983). On the other hand, there is little evidence to support the idea that teacher evaluations are invalid indicators of teachers effectiveness. At least two strong studies found that principals rated teachers higher whose students achieved greated growth in academic achievement (Armor et al, 1076; Murnane, 1975). Most of the procedures for evaluating teachers used in the studies cited above rate teachers on their use of instructional strategies found to be correlated with student achievement.

Teacher preparation programs have been so often maligned in recent months that it may come as a surprise that the available evidence makes a case for the notion that elementary and secondary students are better off being taught by teachers who are trained in teacher education programs, with all their weaknesses, than by teachers with little or more limited training. At other times, this conclusion might seem intuitively

sensible.

Because the research we reviewed "focused" on a broad range of teacher behaviors, and measures of effectiveness were not specifically tried in most cases to those behaviors, the available evidence does not allow us to identify how differences in teachers' capabilities accounted for differences in their performance. It is clear, however, that teachers learn how to do things through their education courses that might reasonably be expected to improve student achievement.

Can Teacher Education Programs Teach Instructional Strategies

The proposition that teacher preparation programs are worth reforming would be more persuasive if it could be shown that the things students preparing to teach are taught and actually learned. In other words, do teacher preparation programs do more than socialize and funnel people into the teaching profession? The answer, of course, depends on the teacher preparation program.

There are a number of studies showing that particular efforts by education schools to structure preservice teacher learning have the desired effects (Murphy, 1972; Francke, 1971; Collins, 1976; Gabrys, 1978; Joyce & Weil, 1972).

The question of whether teachers take these capabilities into the classroom and sustain them is a matter of considerable debate among teacher educators. Some preparation programs clearly have staying power (Adams, 1982; Hord & Hall, 1978), but others do not (Fullen, 1982).

What schools of education have done to encourage the utilization and further development of the knowledge and skills they promote is not dealt with by the research we reviewed. However, many teacher educators believe

that continuing support during the first one or two years of teaching (the so-called "induction period") is essential. We will return to this point below.

Summary

It seems clear that teachers who participated in preservice teacher preparation programs are more likely to be, or to be seen to be by supervisors or other trained observers, more effective than teachers who have little or no formal training before they teach. And, efforts to teach preservice teachers specific capabilities and knowledge invariably appear to be effective, at least in the short run.

This evidence does not mean that some radically different way than we now use to train teachers might be more effective. The available research does suggest, however, that identifying the characteristics of effective preservice college or university based teacher preparation programs could be expected to lead to improvements in the quality of teaching in the nation's schools.

Standards for Admission to Teacher Education Programs and for Entry to the Profession

It is widely believed, judging by the actions of state legislatures and various national commissions, that the quality of teaching will improve if standards for admission to teacher education programs and for teacher certification were raised. This intuitively sensible proposition is not, however, consistently supported by the available research, at least if the standards involved are measured by overall scores on standardized admission tests, grade point averages, performance on the National Teacher Examination, or faculty evaluations of student teachers.

There is, on the other hand, some reason to believe that teachers' or

teacher candidates' verbal ability is correlated with student performance. Let us consider these conclusions in more detail.

In general, principal's or supervisor's ratings of teacher performance are not related to scores on conventional measures of academic aptitude such as the American College Testing (ACT) examinations, the Scholastic Aptitude Test (SAT) (Baker, 1970; Ducharme, 1970; Maguire, 1966), the Miller Analogies Test (MAT) (Young, 1977) or standardized achievement tests (Baker, 1970). Piper and O'Sullivan (1981) found that National Teacher Examination (NTE) scores correlated positively with student teachers' ratings by university supervisors (.43).

Evidence on the relationship between teacher performance on the job, as measured by principal's and trained observer's ratings, and college grade point averages is mixed. Some studies find a small positive association (Massey & Vineyard, 1958; Ducharme, 1970; Siegel, 1969; Druva & Anderson, 1983), and others find no relationship (Thacker, 1965; Baker, 1970), or a negative relationship (Shim, 1965). Denton and Smith (1984) found no relationship between the grades of either education majors or nonmajors and the cognitive attainment of the students they taught. Eash and Rasher (1977) found that student teachers with higher grade point averages were more highly evaluated by the students they taught than were student teachers with lower grades. Principals, however, ranked the student teachers with higher grades superior on only two of the 27 items upon which they were evaluated. In some cases, researchers have looked separately at the relationship between effectiveness and the grade point averages of elementary and secondary teacher candidates and at teacher candidates' performance in education courses as compared to other courses but the findings vary from study to study with no pattern.

Ducharme (1970) found that faculty who supervise student teachers seem, by their evaluations, to be able to identify prospective teachers who will be evaluated highly by their on-the-job supervisors but Thacker (1965) found no such relationship. Maguire (1966) found positive relationships between employing principal's ratings of first year teachers and grade point averages and faculty evaluations of student teachers. But in a follow-up study three years later, these relationships no longer existed. Indeed, Maguire found that there was a negative relationship between fourth year and first year principal evaluations of individual teachers.

In one small study, Galluzzo (1983) found that the teacher preparation programs contributed to students' performance on the National Teacher Examination (NTE). One might infer this from the perceived relationship between ratings of effectiveness during student teaching and scores on the NTE. In a study of newly employed elementary school teachers in Louisiana, Cornett (1984) found that regularly certified teachers scored significantly higher on the NTE area examination testing knowledge of children and the process of teaching at the elementary level than did teachers who were provisionally certified. Provisionally certified teachers took, on average, fewer education courses than did those regularly certified. On the other hand, provisionally certified teachers scored significantly higher on the Weighted Common Examination of the NTE even though forty percent of this test deals with professional knowledge. Cornett (1984) also compared the scores of regularly and provisionally certified teachers in North Carolina on the Weighted Common Examination of the NTE and found no difference.

Some researchers have found that supervisor's or principal's ratings

of teacher or student performance are positively related to a student's score on the National Teacher Examination (Piper & Sullivan, 1981). Other studies, however, have found no such relationships (Thacker, 1965; Ducharme, 1970).

Evidence on the relationship between teacher scores on the NTE and student achievement is limited and mixed. Lins (1946) found a small positive relationship between teachers' scores on the Common Examinations and student achievement. Sheehan and Marcus (1978) found a significant positive relationship between NTE scores and student achievement. Other studies, however, show no relationship between NTE scores and student achievement (Summers and Wolfe, 1977; Pugach and Raths, 1983; and Darling-Hammond and Wise, 1983). Ducharme (1970) found an inverse relationship between teacher NTE scores and student achievement.

Many states have developed or are developing common tests of professional knowledge. Georgia is one of the first states to take this step. Little, however, is known about the ability of these tests to predict teacher effectiveness. Cornett (1984) recently examined the relative performance of Georgia teachers who were graduates of arts and science and teacher education programs on teacher certification tests. On a test of individuals' knowledge of their teacher field, arts and science students with a bachelor's degree scored .7 of a point higher than their teacher education peers (79.3 to 78.6). On the same test, teacher education students with a master's degree outperformed the master's degree arts and science educated teachers by 2.5 points.

In 1963, Getzels and Jackson reviewed the existing research on the association between teacher intelligence and effectiveness and found

little evidence of such a relationship. More recent research, however, shows a modest relationship between the verbal ability of teachers and the ability of teachers and the verbal test scores of students, especially low income minority students (Summers & Wolfe, 1977; Winkler, 1972; McLaughlin & Marsh, 1978; Murnane & Phillips, 1978; Hanushek, 1977; Bruno & Doscher, 1981; Coleman et al., 1966). These findings are reinforced by an earlier study of Massey and Vineyard (1958) showing that principals ranked teachers higher who had scored well on tests of English expression. (This research seems in conflict with the evidence that there is no relationship between the overall SAT scores and teacher performance although the SAT scores include performance on mathematical tasks).

There is a handful of studies that seek to relate preservice attitudes and personality to teacher behavior and perceived effectiveness. These studies generally show no consistent relationships between such sources of predisposition and the outcomes studied. About all one can say from this research with some certainty is that people who demonstrate greater pre-entry commitment to teaching as a career are less likely to drop out of teaching at a later time--a hardly surprising finding. In any case, screening teachers on the basis of attitudes toward teaching or on the basis of nonpathological personality differences seems a precarious enterprise and has not been seriously proposed as a way of improving the teaching profession.

In summary, while raising admission standards to teacher education programs and testing teachers' knowledge prior to their certification are among the most widely proposed teacher preparation reforms on the nation's agenda, there is little evidence that conventional ways of screening teachers--except, perhaps, tests of teachers' verbal ability--have

predictable results. The research on this issue is limited, both in volume and quality, but is suggestive either of a need for caution or the need for more study before firm standards are set. There is simply no way to know what minimal standards for admission, either to college or to the teaching profession, would result in denying access to persons who would not be successful teachers.

Of course, there may be other reasons for increasing college admission and career entry standards. These include gaining more status for teachers generally, setting basic levels of academic competence because teachers often serve as models for their students or allowing the introduction of a more academically rigorous curriculum into teacher preparation.

Many reformers seem to feel that teacher educators oppose higher admission or professional entry standards. This does not appear to be the case though they surely differ on what criteria are most appropriate. It is interesting to note that at the 1984 meeting of deans of education at land grant universities and major private universities, the assembly voted overwhelmingly for admission standards that would, if implemented, probably reduce teacher education enrollments in most of their schools. Kerr (1983) contends that university faculty have often repudiated attempts by education schools to increase admission standards for teacher preparation programs. One reason for this is that students enrolled in education, in effect, subsidize other courses of study because of (a) state and university funding formulas (Peaseau & Orr, 1980) and, (b) to hear teacher educators tell it, larger student loads per faculty member.

Deriving the Content of Teacher Preparation Programs from Research on Effective Teaching

Direct research on the consequences for teacher effectiveness of variations in teacher preparation programs is almost nonexistent. One might reasonably argue, therefore, that the core of what teachers should learn in the pre-entry preparation for their careers could be derived from what is known about effective teaching. This assumption seems to be gaining increasing currency among teacher educators (Smith, 1983; Egbert & Fenstermacher, 1984), though there are few programs of teacher preparation that are based primarily on research-based conclusions about teaching and learning (Egbert & Kluender, 1984).

In this section we identify several capabilities of effective teachers that, if they could be developed in preservice teacher preparation programs, would be likely to increase the contributions teachers make to student achievement. A wealth of research exists which shows that teachers have significant effects on their students' achievement in both elementary and secondary classrooms (Brophy, 1979; Brophy and Good, forthcoming; Good, 1979; Medley, 1977).

Since the mid-seventies, a number of large scale studies of classroom teaching have produced an accumulation of sensible findings which have also been replicated. Findings from these studies produced a growing body of knowledge about the relationships between teaching practices and student learning in the basic skill areas which can support educational policy decisions. Some cautions are in order, however,since the bulk of the research was conducted at the early elementary grades in basic skills areas in schools serving primarily low socio-economic status populations. When attempting to use findings to inform practice it is important to consider

the various contexts such as grade level, sex of student, SES level, ability level in which teaching takes place. In cases where researchers have allowed context comparisons, findings across contexts reveal a different pattern of results. Examination of the findings from studies of teaching indicate there are few if any teaching skills which will apply at all times in all settings.

Nonetheless, there appear to be a number of teacher behaviors that are sufficiently generic that they should be understood by all teachers. These behaviors, which might be called core teaching skills (CTS), comprise a common body of professional practices that can be adapted to variations in context, learning objectives, and student needs. How such adaptation might be facilitated by teacher preparation programs is an issue we will turn to in the next section.

CTS-1: Maximize Academic Learning Time

The most consistently replicated findings in research on teaching are those that demonstrate that achievement is linked to the quantity and pacing of instruction. Another way to describe these findings is that they are related to the opportunity to learn and academic content covered by students. The major intervening variable between teacher instructional behavior and student achievement is academic learning time (ALT), or the amount of time that students spend engaged in academic tasks that they can perform at high success rates (Fisher, Filby, Marliave, Cahan, Dishaw, Moore, & Berliner, 1978). ALT is the combination of three measures: allocated time, the time set aside for students to work on academic tasks; engaged time, that proportion of allocated time in which students are actually engaged in those tasks; and student success, essentially task appropriateness which is a measure of student task success or failure. Data from BTES (Fisher et al., 1978) indicate that large increases in ALT also

yielded increases in student achievement.

To learn efficiently students must be engaged in activities that are at the appropriate difficulty level, however, and it is important to make sure that students make continuous progress along the way. Lessons should run smoothly without loss of momentum and this requires that teachers be effective in diagnosing learning needs and prescribing appropriate learning activities and tasks. Research on optimal error rates and student achievement suggest that classroom questions should yield about 75% correct responses, seldom yield no response at all, and seatwork activities should be completed with a higher rate of success (90 - 100%) by most students (Brophy & Evertson, 1976; Brophy, 1979; Rosenshine, 1983).

How time is used appears to be more important than the actual number of minutes available. Stallings (1975) found that even when the length of the school day in follow-through classrooms varied in length as much as 1 1/2 hours and secondary school remedial reading classes varied from 40 to 55 minutes (Stallings, Needels, & Stayrook, 1979), these variations were unrelated to student academic achievement.

CTS-2: Manage and Organize the Classroom

In order to maximize academic learning time and successfully employ a repertoire of teaching strategies, the initial task that all teachers must master is the management and organization of their classrooms. Classroom management is the largest area of concern for both new and experienced teachers. Veenman (1984) reviewed 83 studies which appeared since 1960 on the perceived problems of beginning teachers. These studies showed that the most frequently perceived problem was classroom discipline (or the larger area of classroom management). This concern held for both elementary and secondary teachers.

A growing body of research on managing and organizing the classroom suggests that some practices are not only more effective than others but these practices have effects on student task engagement and attention to academic tasks as well (Emmer, Evertson, & Anderson, 1980; Evertson & Emmer, 1982a). Good classroom management skills have the effect of optimizing the time devoted to instruction. To this extent, these skills not only allow the stage to be set for teaching and learning, but maintain efficient routines and procedures throughout the year.

There are at least two views of effective classroom management. The first view emphasizes techniques for dealing with students who are disruptive or otherwise uncooperative. A variety of writers and clinicians have developed programs and techniques for training teachers to deal with disruptive and inappropriate behavior which threatens the classroom environment (Glasser: Reality Therapy; Gordon: Teacher Effectiveness Training; Cantor: Assertive Discipline). While these techniques can be useful, they are aimed largely at intervening once problems have occurred (Brophy, 1983).

The second view, and the one with the most relevance for inclusion in teacher preparation programs, emphasizes setting the stage for teaching by prevention of problems before they occur. This includes careful planning, well-paced lessons geared to students' abilities and interests, setting up efficient routines for taking care of procedural tasks, and creating a classroom climate that is task-oriented, pleasant and purposeful. Kounin (1970) found that successful classroom managers kept their students actively engaged in productive classroom work, thus minimizing the amount of trouble that they had to deal with. They were more successful because they reduced the frequency of trouble, not because they were somehow more skilled at dealing with it once it broke out.

Subsequent studies by Evertson, Emmer and others added to this body of knowledge by examining in detail how teachers planned and presented their management systems from the first day of school (Evertson & Emmer, 1982b).

Evertson and Emmer (1982) and Emmer, Evertson, and Anderson (1980) found that successful classroom managers:

-- Planned the classroom rules and procedures in detail prior to the beginning of school and taught these to students.

-- Made clear the consequences and rewards for appropriate and inappropriate behavior.

-- Carefully monitored student work and behavior, stopping inappropriate behavior quickly.

-- Kept students accountable for academic work.

-- Provided time for explanation, rehearsal, and feedback of academic content.

Training studies show that strategies such as these can be taught to most teachers relatively efficiently and with good success (Borg & Ascione, 1982; Evertson, Emmer, Sanford, & Clements, 1983; Evertson, 1984; Fitzpatrick, 1982).

Three aspects of classroom management and organization may deserve more extensive discussion because in many teacher preparation programs they seem to be trivialized, as in cases of structuring physical space and the planning of lessons, or neglected, as in the case of grouping.

Structuring the physical space. Effective managers arrange their classroom space to accommodate different types of learning activities, make sure that all students are visible and can be reached for independent help, and minimize traffic flow problems and congested areas (Emmer, Evertson, & Anderson, 1980; Brophy, 1983; Evertson & Emmer, 1982b). Transitions between activities are accomplished with a minimum of wasted time (Arlin, 1979). Preplanning the use of physical space can maximize student access to and use of materials and participation in activities (Nash, 1981). The organization

of the space and its use is even more essential in classrooms with many students engaged in different tasks.

Planning lessons is integral to effective teaching. Shavelson (1983) states that there is need for research on teaching to examine not only teachers' behavior but their judgments, plans, and decisions. Research which links teachers' intentions to their behavior can provide a basis for implementing educational innovations. Decisions made during planning influence the teacher's classroom behavior. These instructional plans, whether for the school year, semester, month, unit, or day, serve as scripts for carrying out interactive teaching (Shavelson & Stern, 1981; Smith & Sendelbach, 1979). According to Joyce (1979), through proactive decisions teachers set up a series of conditions which powerfully influence the possibilities of decision making thereafter. Green and Smith (1983) also note that even if teachers plan lessons these become modified as teachers and students interact with materials and activities. Shavelson (1983) also points out that plans that are too detailed and inflexible can be counter productive, as the need arises to shift lessons according to student needs.

Grouping is an essential aspect of managing and organizing the classroom and providing opportunities for students to learn academic content. In highly heterogeneous classes grouping may be based on differences in achievement, language dominance, or ability. Traditionally students have been placed in high, medium or low groups so that teachers could provide appropriate instruction and could monitor students more closely. This practice is not without its problems however. Any time that teachers shift from a whole class focus and create subgroups within classes more complex planning and group management is required. Evertson, Sanford, and Emmer (1981) found that even effective managers had difficulty

at the beginning of the year until more complex routines were established.

Ability grouping has raised serious questions regarding its possible effects on children's self images, motivation and perceptions, and its potential for labelling students. Green and Smith (1983) point out that students in low groups received different input in terms of content and strategies for reading. Lessons for low groups consistently placed greater emphasis on pronounciation and single word decoding, whereas errors in high groups were often ignored in favor of "getting the meaning." Weinstein (1983) documents how children perceive the teachers' relationship to high and low achieving students. Still in highly heterogeneous large classes teachers may have little choice. Making the most out of grouping requires good classroom management skills in order to provide productive experiences for all students.

An alternative to traditional grouping is peer tutoring, a practice which is intended to provide students with more resources for help with academic work. Cohen, Kulik, and Kulik (1982) completed a meta-analysis of studies of peer tutoring and found an average effect size of peer tutoring on academic achievement of .40 (a moderate effect). Another review by Goodwin (1982) supported the Cohen et al. findings and added that both cross-age and same age tutoring increased achievement of the tutees in mathematics and reading, but no consistent relationship was found between length and intensity of tutoring training and likelihood of gains in achievement. Greenwood, Whorton, and Delquadri (1984) concluded that peer tutoring increased the proportion of time that students were academically engaged compared to classrooms with conventional teacher-to-student assistance by as much as 20 to 40%.

An alternate way of providing for peer interaction comes from Slavin's (1980) work and is commonly referred to as cooperative learning. Teams-

Games-Tournaments (TGT), Student Teams Achievement Divisions (STAD), and the Jigsaw Method are three versions that have been developed. In TGT students compete at three-member, mixed ability "tournament tables" with simple academic games. Individual student scores contribute to the total score of the team. STAD is similar except that games are replaced by individual quizzes. In the Jigsaw Method each student is given an essential piece of information needed by all group members to complete work.

Slavin (1980) reviewed 28 field projects in cooperative learning with such diverse outcome measures as academic achievement, race relations, and the development of mutual concern among students. TGT showed consistent positive results on all three dependent variables across a wide variety of settings, subjects, and grade levels. Reviews on STAD also show positive effects of these techniques on academic achievement and race relations. The Jigsaw Method, however, showed little effect on achievement one way or the other.

Although pre-service teachers can benefit from training in these alternate methods of grouping students for a variety of tasks, it is also important to note that students are not likely to know how to work in groups unless training is provided. Wilcox (1972) found that students trained to lead groups by encouraging all to participate and to make certain that everyone had a turn were better at solving specific problems than were untrained leaderless groups. Trained student leader groups were also better problem solvers than were classroom teachers, who tended to do all the problem solving themselves.

CTS-3: Utilize Interactive Teaching Strategies

Research shows that students achieve more in classrooms where they are actively supervised and taught rather than being left alone to work on their

own for long periods (Brophy, 1983; Soar & Soar, 1983). Class activities include frequent lessons in which the teacher presents information and develops concepts through lecture and demonstration, elaborates this in feedback to students, and prepares for seatwork with demonstrations and examples to clarify instructions and tasks (Good, 1979; Good, Grouws, & Ebmeier, 1983; Rosenshine, 1983).

Rosenshine (1983) reviewed seven experimental studies in which teachers were trained to perform behaviors outlined in specially designed manuals (Anderson, Evertson, & Brophy, 1979; Good & Grouws, 1979; Evertson et al., 1983; Emmer, Evertson, Sanford, Clements, & Worsham, 1984; Fitzpatrick, 1982; Reid, 1978-82; Becker, 1977). The results showed that the treatment teachers implemented many of the principles more frequently than the control teachers. The treatment teachers attended to inappropriate behavior more frequently, commanded the attention of all students, provided immediate feedback and evaluation, set clear expectations, encouraged a warm and supportive classroom environment and allowed fewer interruptions. Rosenshine outlined six teaching functions extracted from these studies:

1. Daily review, checking previous day's work, reteaching (if necessary).

2. Presenting new content skills.

   Provide overview.
   Proceed in small steps at a rapid pace.

3. Initial student practice.

   High frequency of questions and overt student practice.
   Prompts provided during initial learning.
   All students have a chance to respond and receive feedback.
   Teacher checks for understanding.
   Practice continues until students are firm.
   Success rate of 80% or higher during initial learning.

4. Feedback and correctives (recycling of information if necessary).
   Feedback to students particularly when they are hesitant.
   Student errors provide feedback to teacher that corrections are necessary.

Correcting by simplifying question, giving clues, explaining or reviewing steps, or reteaching last steps.
Reteach using smaller steps if necessary.

5. Independent practice so that student learning is firm and secure.

   Seatwork.
   Unitization and automaticity (practice to overlearning).
   Need for procedure to ensure student engagement during seatwork is 95% correct or higher.

6. Weekly and monthly reviews: reteaching if necessary.

Rosenshine notes that independent investigators appear to have come up with similar conclusions about effective instruction and are guided by student achievement data. The fact that these programs are more alike than different helps validate the research (cf. Hawley & Rosenholtz, 1984). Bennett (1982) states that these programs make teachers aware of these teaching functions, bring them to a conscious level and enable them to develop strategies for consistent, systematic implementation. It appears that these teaching functions could provide a basis for training pre-service teachers in effective instruction.

CTS-4: Communicate High Expectations for Student Performance

Several reviews of the research on teacher expectation effects confirm the fact that some teachers behave differentially toward low achievers in ways that communicate that they expect less of them (Brophy, 1982; Brophy & Good, 1974; Cooper, 1979; Braun, 1976). This differential teacher treatment contributes to the widening achievement gap.

Good (1983) notes several ways that teachers have been found to differentiate their behavior toward students perceived as high or as low achievers. Among them are: seating slow students farther from the teacher; calling on lows less often to answer questions; waiting less time for lows to answer; criticizing lows more for incorrect responses; praising lows less frequently than highs for correct responses; demanding less work and effort

from lows and interrupting the performance of low achievers more frequently than that of high achievers.

Although most of the research in the early seventies on teacher expectations was correlational, leaving the possible argument that teachers held high expectations for high achievers because they did indeed achieve at higher levels, Still some research shows that positive teacher expectations are associated with student achievement gain (McDonald & Elias, 1976; Brophy & Evertson, 1976).

Martin (1973) conducted a study in Los Angeles where inner city teachers were sensitized to ways that low expectations could be communicated. Results after training showed that treatment teachers were able to elicit higher student achievement and better attitudes. Results of this work formed the basis for the Teacher Expectations Student Achievement Program (TESA).

CTS-5: Reward Student Performance

One of the most studied aspects of classroom teaching has been the use of rewards and incentives to reinforce skill mastery and to motivate student task engagement. Rewarding appropriate performance is part of the maintenance of activities and tasks in any classroom as well as the vehicle for providing students feedback and knowledge of results.

Behavioral analysis procedures have been used extensively to modify classroom behavior. These reinforcement techniques also are useful for shaping student behaviors that relate to academic achievement such as attending, task engagement, and independent study skills (Lipe & Jung, 1971). The teacher's knowledge and use of these skills can be a major determinant in increasing behaviors which are facilitative of academic achievement.

Lysakowski and Walberg (1982), in a synthesis of the relationship

between teacher reinforcement and learning, concluded that the effects of instructional reinforcement were constant across the contexts of grade level, type of school (public or private), socio-economic status, and community types.

Three ways that reinforcement techniques can be used in classrooms will be briefly described below.

1. Survival skills training is based on the work of Cobb et al. (Cobb, 1972; Cobb & Hops, 1972) and supposes that students require certain skills to be effective learners. The reinforcement of these skills (attending, volunteering, complying with directions) and other behaviors consistent with appropriate classroom behaviors (e.g., talking with teacher, interaction with peers, approval) increased the reading achievement of low achieving students in first, second, and third grades.

2. Praise. The findings on the use of praise as a reinforcer have been mixed and even negative in many studies of classroom teaching (Brophy & Evertson, 1976; Soar & Soar, 1983). Brophy's (1981) review of the functions of praise has illuminated some ways in which praise can be effective, such as focusing on specific achievements that make the relationship between praise and the behavior explicit. Praise seems most effective when used with young children in the early grades and students of low ability or low SES backgrounds, but it loses its relative effectiveness with students in the upper grades or with high achievers.

3. Structure of rewards. The reward structures of the classroom refer to the rules and arrangements of student groupings which set groundrules for the rewarding of academic performance. Essentially these structures can be classified as individual or group, competitive or cooperative. Competitive structures, such as grading on a curve, mean that

the receiving of a reward by one diminishes the chances of rewards for others. Cooperative structures function in such a way that the good performance of one student can increase the likelihood of rewards for the other students. Individual reward structures are most effective when there are fixed criteria for reinforcement and the probability of one receiving an award is unrelated to the probability of another's receiving a reward.

Slavin (1977) found no real difference in the efficacy of different reward structures with high achieving students. However, low achieving students did decidedly better with the cooperative arrangement. This is also supported in research reviews by Sharan (1980), Ames (1981), and Johnson et al. (1981).

As with many of the promising practices derived from research on teaching, the effectiveness of any reward structure or method of reinforcement is context-bound and requires that the teacher consider the setting, the instructional goals, and the type of student population.

Summary

We have drawn on several already existing reviews included here (Hawley & Rosenholtz, 1984; Brophy and Good, forthcoming; Good, 1979, 1983; Stallings, 1984; Rosenshine, 1983) to provide, given the limits of space, as comprehensive a picture as possible of the major core teaching skills which can be identified that promote student learning.

The core skills outlined were:

— Maximizing academic learning time by providing students with sufficient opportunities to learn and to cover of academic content.

— Managing and organizing the classroom, including arrangement of the physical space, planning rules and procedures and teaching these to students, making clear the consequences and rewards for appropriate and inappropriate behavior, monitoring student work and behavior, keeping

students accountable for academic work, providing time for explanation, rehearsal, and feedback, planning lessons and providing for alternate ways of grouping students.

-- Utilizing interactive teaching strategies which place emphasis on frequent lessons in which the teacher presents information, develops concepts through lecture and demonstration, and elaborates this with feedback to students.

-- Communicating high expectations for student performance in which teachers maximize opportunities for both high and low achievers to participate in ways that facilitate their learning. This includes providing lows with ample opportunities to respond, answer questions and participate appropriately in lessons.

-- Rewarding student performance so as to reinforce appropriate student behavior that is related to academic achievement and to provide students with feedback and knowledge of the results of their efforts.

The foregoing review is intended to highlight those basic areas that research has shown are important to student academic achievement and engagement in academic tasks. While it seems reasonable that programs for preservice teacher education that provide prospective teachers with the knowledge and basic competence to perform these core teaching skills will consistently produce effective teachers, there has been no research that demonstrates that this assumption is correct.

Subject Matter Expertise and Teacher Effectiveness

A ubiquitous theme in efforts to reform teacher education is the call for teachers who are more knowledgeable about the topics they teach. It seems clear enough that one must know what one teaches to be fully effective. No one seems to disagree with this proposition. The policy issue here is how much teachers must know and how that expertise can be

determined. Judging by debates among teacher educators, these issues seem more difficult to resolve for elementary than for secondary teachers.

The most extensive assessment of the effects of subject matter knowledge on teaching effectiveness is a recent meta-analysis of 65 studies of science education (Druva & Anderson, 1983). Three conclusions from this study seem most relevant to our concerns.

1. "There is a relationship between teacher preparation programs and what their graduates do as teachers. Science courses, education courses, and overall academic performance are positively associated with successful teaching."

2. "The relationship between teacher training in science and cognitive student outcome is progressively higher in higher level science courses."

3. "The most striking overall characteristic of the results . . . is the pattern of low correlations across a large number of variables involved." (Druva & Anderson, 1983, p. 478)

With respect to the teaching of other subjects, the relationship between teacher expertise and teacher performance is mixed. Massey and Vineyard (1958) found positive but small relationships as did Begle (1972) who characterized the association he found as "educationally insignificant." Maguire (1966), Siegel (1969), and Eisenberg (1977) found no or negative relationships between teacher knowledge, as measured by grade point averages and standardized tests, and student achievement. The General Accounting Office (1984) cites a 1983 synthesis of research by Colin Byrne that it characterizes as finding "no consistent relationship between the knowledge of teachers and the achievement of their students" (p. 33).

In summary, we read this research as saying that knowing one's subject matter does not necessarily make one a good teacher of that subject. But it also seems reasonable to conclude that teachers with good instructional capabilities would be more effective if they had good knowledge of the subjects they teach. This is, logically enough, more true of teachers of

advanced courses. But the research does not allow us to prescribe the minimum level of knowledge a teacher should have to teach a given topic effectively and thus provides little specific direction to designers of teacher preparation programs.

The Pedagogy of Teaching to Teach

There is an old saw, "Those who can't do, teach; those who can't teach, teach teachers." In a previous section we discussed evidence that should put this canard to rest. Nevertheless, most teacher educators acknowledge that they do not always model exemplary teaching practices.

There are any number of strategies for preparing teachers that teachers educators have promoted over the years. We focus our attention on three general processes, "competency based education," "microteaching," and "practice teaching." We are concerned less with specific variations of these strategies than with the basic elements of the learning process that they embody.

Competency Based Teacher Education

Competency Based Teacher Education (CBTE) is a term that has lost precise meaning. Generally, CBTE refers to specific efforts to train prospective teachers to acquire certain competencies believed to be associated with effective teaching. The logic of this approach is similar to the pedagogy involved in teaching basic skills in elementary schools: be clear about what is to be learned, design lessons that fit that objective, teach the lesson, test for learning, provide feedback, and redesign the lesson and teach again. By the early 1970s, having received a considerable boost from funds provided through the United States Office of Education, CBTE and its equivalents were seen by many teacher educators as the one best

way to professionalize teacher preparation. But, CBTE came under attack for being too technical and leading to the increasing specification and proliferation of skills to be learned that had no compelling link to student learning (cf. Sarason, 1978-79; Hamilton, 1973, as cited in Bush & Enemark, 1975). Enthusiasm faded. It is estimated that at the outset of the 1980s about 13% of the 1200 institutions that train teachers used some more or less fully developed form of CBTE (Kerr, 1983).

The idea that CBTE lacked a validated knowledge base has considerably less credibility than it did six or seven years ago when attacks on CBTE were in full swing. This fact, plus the increasing propensity of states and school systems to develop performance based teacher evaluation programs that spell out specific teaching behaviors that are to be emulated, suggest that CBTE, no doubt in various disguises, is likely to be born again.

Research on the effects of CBTE on teacher attitudes and behavior seems to show positive results (Adams, 1982; Joyce, Wald, & Weil, 1981; Piper & O'Sullivan, 1981; Borg, 1972; see also the sources cited below related to microteaching).

Microteaching

Microteaching can take many forms but it essentially involves would-be teachers' organizing and delivering a short lesson. Often, specific competencies are to be demonstrated in the lesson, such as planning, interactive questioning, etc., and the lesson is evaluated accordingly. Microteaching is, in short, a simulation technique that focuses on particular learning objectives for the teacher candidate and through which evaluation and feedback is provided.

In general, it appears that microteaching--some versions of which are called minicourses—is an effective pedagogical device (Copeland, 1975; Boeck, 1972; Borg, 1972; Blankenship, 1970; Kocylowski, 1970) although the

acquisition of teaching competence does not always occur (Kallenbach & Gall, 1969).

One of the virtues of microteaching appears to be that it facilitates immediate feedback about and analysis of performance. As Gage concludes, "Evidence for the efficacy of feedback about teaching performance is fairly consistent. When the information is explicit, clear, and keyed to specific aspects of teaching behavior, feedback results in improvement in the trainees' ability to perform according to a model of teaching" (Gage & Winne, 1975). The usefulness of frequent and precise feedback as an instrument for promoting the improvement of teaching effectiveness is not limited, of course, to microteaching (cf. Flanders, 1970).

Student Teaching

Student or practice teaching is usually identified by new teachers as the most rewarding and useful aspect of their preservice professional preparation (Griffin et al., 1983; Nemser, 1983). These claims by teachers, plus widespread skepticism about the rigor and scientific basis of many formal courses in teacher preparation, probably have contributed to a rash of contemporary proposals that would place apprenticeship at the core of teacher preparation.

The existing research, however, provides little reason to believe that supervised practical experience, in itself and as it is encountered in most student teaching situations, is a very effective way to educate teachers.

A decade ago, Peck and Tucker (1973) reviewed research on teacher education and concluded that, ". . . by the end of student teaching, there are some almost universally reported decrements in attitude and in teaching behavior, as compared with the starting position of students prior to their field experience" (p. 967).

In what may be the most intensive study of practice teaching yet conducted, Griffin and his colleagues (1983) found that little change occurred in the student teachers as a result of their involvement. The study's description of the characteristics of the student teaching experience has within it seemingly important implications for how the student teaching component of teacher preparation might be structured.

1. Support participants such as supervising teachers and university superiors seemed very adequate on a personal level, yet insufficient in terms of helping student teachers to understand performance standards for professional practice.

2. Student teacher participants received exposure primarily to situation specific teaching strategies rather than to options from which they might select appropriate modes of instruction.

3. Participants lacked an awareness of policies, expectations, purposes, and desirable practices involved in the student teacher experience.

4. Only minimal evidence surfaced suggesting that students received exposure to any sort of integrated instruction linking their inservice coursework to the actual student teaching situation either substantively or ideologically.

5. Few instances existed of demonstrated policy, practice, or personal linkages between the university and the public school settings.

6. Student teacher participants appeared to be isolated from other participants.

7. An absence of public and enforced standards of performance probably contributed to the fact that few of the student teachers in this study were deemed to be less than satisfying.

Neither Griffin's research nor any other study we could find linked specific characteristics of the student teaching experience to teacher performance. The generally critical character of the research suggests, however, that the role of practice teaching in the preparation of teachers may be overrated.

Theoretically, student teaching, if structured properly, could be productive of teacher effectiveness. But it may also be that the problems and costs of successfully implementing practice teaching programs are so

great that other processes for achieving its objectives should be explored.

The Induction Phase of Teacher Learning

Almost all reviews of the research on teaching caution consumers not to treat what we have called core teaching skills as fundamentalist dogma. Instructional practices, it is invariably argued, should be adapted to meet student needs and to take into account different learning objectives and social contexts. As Brophy and Evertson (1976) point out:

> . . . effective teaching is not simply a matter of implementing a small number of basic teaching skills. Instead, effective teaching requires the ability to implement a very large number of diagnostic instructional, managerial, and therapeutic skills, tailoring behavior in specific contexts and situations to the specific needs of the moment. (p. 139)

The need for flexibility and judgment on the part of teachers poses a serious problem for teacher educators. They are being pressed by their colleagues and by state legislatures to build the knowledge base and specific skills of new teachers. They are also being urged to be more practical and less theoretical and to emphasize performance on standardized tests.

It is doubtful that most teacher preparation programs now do much to enable and encourage prospective teachers to be adaptive (cf. Joyce & Clift, 1984). Moreover, as we noted above, the practice teaching phase of teacher preparation more often narrows than expands the range of instructional strategies teachers feel they can employ. Further, the induction period of teaching is so chaotic and absent of support that teachers often focus on instructional strategies that stress control over student behavior rather than the facilitation of learning (Hawley & Rosenholtz, 1984, chap. 2). As Joyce and Clift (1984) conclude: "The current process of learning to teach socializes teachers to a 'practicality ethic'. . . where survival concerns

dominate."

Most teachers believe that they received almost no support once they started to teach (Joyce, Bush, & McKibbin, 1981). Indeed entry into the profession is often sudden, with the beginning teacher shouldering many of the same responsibilities as the veteran teacher. Lortie (1966) refers to this experience as the "sink or swim" Robinson Crusoe approach. The stresses and problems of the beginning teacher in the year following graduation from a teacher preparation program and the onset of inservice teaching have been documented by some researchers (Ryan, 1980, 1982; McDonald & Elias, 1982). "Induction," as this phase is called, is becoming a focus of attention as teacher educators come to think about teacher education along a professional continuum from preservice to inservice (Hall, 1982; Tisher, Fyfield, & Taylor, 1979). At the very least, knowledge about the problems which beginning teachers face as they start their teaching careers can provide important information for the design and evaluation of preservice teacher preparation programs.

There are numerous studies that document the changes that can accompany the reality shock of the world of the school and classroom for the new teacher. Veenman (1984), for example, cites perceptions of problems (pressures, complaints about work load); changes of behavior (contrary to one's own beliefs because of external pressures); changes of attitudes (shifts from progressive to conservative attitudes about teaching methods); changes of personality (e.g., lability-stability) and decisions to leave the profession. In short, many beginning teachers, once in their own classrooms, are confronted with social realities that are very different from those encountered in their preservice training. Doyle (1980) touches on the same complexity when he states that there are persistent features of the classroom environment which leave the new teacher with little time to

reflect before being forced to act. These are: multidimensionality, simultaneity, immediacy, unpredictability and history. He states that these terms are designed to suggest that classrooms are crowded with people, activities and interruptions; events take place at the same time; and there is little time for the teacher to anticipate the direction of events. Additionally, the primary task of the teacher is to ensure cooperation in activities and to keep activities in place.

Veenman (1984) states that even though there is considerable agreement on the kinds of problems beginning teachers face, findings are often too general to be useful. He proposes three general frameworks as approaches to looking at the process of becoming a teacher.

Developmental Stages of Concerns sets out a theory of teacher development based on the work of Fuller (1969) and Fuller and Bown (1975). Concerns Theory posits three stages in teacher development. The first stage focuses on survival concerns about adequacy, surviving as a teacher, and classroom control. Stage two includes teaching situation concerns and are related to mastery of the material, and skills in the teaching learning situation. Stage three reflects concerns about students, their learning and the impact of teaching practice on students' needs. According to Fuller, later concerns do not emerge until students are freed from earlier level concerns. Studies by Adams, Hutchinson, and Martray (1980) and Adams and Martray (1981) indicate that stage one concerns (concerns about self) did decrease between student teaching and year five in teachers' careers.

The Cognitive Developmental Framework focuses on the teacher as an adult learner. The assumption is that development results from changes in cognitive structures. These structures, or stages, are organized in an invariant hierarchy from less to more complex (Sprinthall & Thies-

Sprinthall, 1983). Persons at higher stages of development function more complexly, possess a wider repertoire of skills, perceive problems more broadly, and can respond more accurately and empathically to the needs of others. Some educational programs have been designed to promote cognitive development along these lines (Glassberg & Sprinthall, 1980; Oja, 1981). Glassberg (1980) studied 13 first year teachers who had participated in student teaching experiences designed to promote psychological maturity and found that beginning teachers at the lower stages saw themselves as defensive, unable to motivate students, and felt discipline was the province of the school administration. Beginning teachers at higher levels of development emphasized the importance of respect, being flexible and tolerant, and the desire to respond in ways that facilitated the academic and personal growth of students.

The Teacher Socialization Framework is focused on the interplay between individuals' needs, capabilities, intentions, and institutional constraints. In this framework, attention is given to changes in the contexts of institutional settings. Gehrke (1976, 1981) sought to understand how beginning teachers adapted to the teacher role to meet their needs as well as adapting to the role demanded by others. Four needs emerged during early role transition: need for respect, need for liking, need for belonging, and need for a sense of competence. Tabachnick, Zeichner, Densmore, and Hudak (1983) studied the ways teachers think about their work and ways they give meaning to beliefs. From Lacey's (1977) work they identified three social strategies used to conform to institutional demands: internalized adjustment (the individual complies with the constraints and believes they are for the best); strategic compliance (the individual complies with the authority figure's definition of the situation but retains reservations); and strategic redefinition (implies that change

is being brought about by those who do not possess the power to do so, but achieve change by causing those in power to redefine the situation). These studies suggest that beginning teachers can give direction to the quality of their socialization into teaching.

The message of all this is straightforward. Unless teacher preparation programs anticipate the nature of the experience teachers will have in their first one or two years of teaching, much of what they do will be seen by teachers as irrelevant and/or will be undone.

What implications does this conclusion have for teacher education? First, curriculum design can take into account the types of concerns teachers are likely to have by warning them about these realities and providing them with some analytical and problem solving skills they can use to deal with the conditions that might undermine their effectiveness.

Second, students need to be introduced to the research on teaching in ways that provide them an understanding of the variety of options they have, the contingencies that mediate the use of specific practices, and the theory which explains the efficacy of the practices. Efforts to increase the conceptual understanding of teaching by increasing awareness of proven models and practices (Joyce & Showers, 1981; Joyce & Showers, 1982) and by training that included theory, demonstration, practice, feedback and classroom application (Showers, 1983) seem likely to be productive.

Third, teachers who collaborate in teacher training programs need to model adaptive behavior and to work more closely with teacher educators to ensure that students explore the range of knowledge and capabilities they should be learning in schools of education (cf. Kilgore, 1979).

Fourth, teacher education programs should place greater emphasis on developing students' capabilities to collect, analyze and use information

to solve complex problems of the kinds they are likely to confront in classrooms (cf. Stalling, 1984).

Conclusion

About one-fifth of all college students enroll in teacher preparation programs at some 1300 colleges and universities. Virtually all commentaries on contemporary education argue that this many students and this many institutions undermine the quality of teacher education. At the same time, it is not possible to identify research-based or, for that matter, widely agreed upon criteria by which one might sort effective and ineffective programs.

Despite the fact that teacher preparation programs have come under seemingly unprecedented criticism in recent months, the available research suggests that among students from the colleges and universities studied who become teachers, those who enrolled in formal preservice preparation programs were more likely to be effective teachers than those who do not. Moreover, almost all efforts within teacher preparation programs to teach students specific knowledge or skills seem to succeed, at least in the short run.

This research does not add up to a defense of teacher preparation as it exists in most institutions. The number of programs studied comprise less than two percent of the total, this handful of available studies have been conducted over four decades, and there is no way to know how representative the institutions studied are of the many colleges and universities involved in teacher preparation.

Even the most aggressive apologists for teacher education acknowledge that improvements can and should be made in virtually all programs. Nonetheless, the research does suggest, at least, that preservice teacher education programs can make contributions to effective teaching.

What guidelines, then, for designing a teacher preparation program that would produce potentially effective teachers would one derive from the research discussed in this report? Designers of a model for teacher preparation must confront a series of decisions concerning (a) standards for admission; (b) the proportion of coursework that will be allocated to general studies, the field of concentration and education courses, including student teaching; (c) what content and learning processes to embody in the education curriculum; (d) what criteria might be used in certifying that prospective teachers are ready to teach; and (e) whether and how the program's obligation should continue into the induction period.

Who Should be Admitted to Teacher Education Programs?

Scores on tests of verbal ability appear to be related to teacher effectiveness. Other measures of student overall academic ability or aptitude, such as the ACT and the SAT, are not consistent predictors of teacher effectiveness. While verbal ability, measured in different ways in different studies, is modestly correlated with the verbal achievement of students, research provides no guideline concerning the level of verbal competence necessary to be a good teacher. Thus, in identifying the effective teacher preparation programs, knowing the standards for admission would not be very helpful. One could, of course, establish such standards on intuition or preferences for the type of people one wants in teaching.

What Should Be Taught?

Undergraduates in teacher preparation programs usually take three types of courses: general studies (liberal arts subjects), an academic concentration, and education courses including field work. While most college students preparing for secondary teaching will "major" in the

subject or constellations of related subjects they will teach, students preparing to teach in elementary schools may "concentrate" in a broad range of subjects, including education, depending on the college or university they attend.

General studies. There apparently is no evidence in the research that speaks directly to the impact on teacher effectiveness of the general studies or liberal arts component of undergraduate education. Findings that overall college grade point average is not systematically related to teaching performance suggests that other concerns might more profitably be the focus of reforms in teacher education.

Field of concentration. Surprisingly, we think, the relationship between teacher's effectiveness and the level of knowledge they have of the subject taught is, at best, small. It is intuitively sensible to believe that, other things being equal, knowing one's subject will substantially increase one's teaching effectiveness. That assumption is found throughout the current proposals for improving teaching. Perhaps the level of subject matter knowledge most teachers have is not great. Perhaps those who have the most knowledge of their field have, generally, less competence in teaching methods. Or, perhaps the research is inadequate to properly test the proposition. In any case, the available research would not lead one to expect that increasing the courses prospective teachers must take in the subjects they will teach will result in noticeable changes in the achievement of the nation's school children. Druva and Anderson's (1983) finding that knowledge of subject matter is most clearly related to student performance in advanced courses may suggest that teachers of such courses should have advanced academic training. (For a skeptical view of the idea that more subject matter depth will lead to improved student performance, see the General Accounting Office's 1984 analysis of ways to improve math

and science achievement in schools.)

Education courses. Education courses can be grouped into three categories, so-called "foundations," teaching methods, and teaching practice.

There is no reference in the empirical research to the efficacy of foundation courses. "Methods courses" presumably should embody current knowledge about effective practices--maximizing academic learning time, classroom management and organization, interactive instructional strategies, the communication of high expectation and the appropriate evaluation and reward of student achievement. Carefully specified and articulated programs of instruction, such as those found in the best competency based programs, seem effective and timely. Opportunities to understand theories that underlie effective practices and to practice what is learned in real or simulated settings like those provided by microteaching are likely to improve teacher effectiveness.

Student teaching. We think that one can infer from the studies reviewed here and from other research that there is reason to link opportunities to practice more closely to coursework on a recurrent and episodic basis, rather than to the commonplace approach to practice teaching which seems to have little support in the research.

In any case, while there is no hard evidence that would allow one to specify the characteristics of practice teaching that are most effective, one can induce from the criticisms of practice teaching some characteristics that might reasonably be used to distinguish programs that work from those that don't. These characteristics include:

1. Specific integration of classroom and practice experiences so that there are opportunities to test, evaluate, and enhance knowledge that is learned in formal courses.

2. The training of practice teacher supervisors (cooperating teachers) in the strategies being taught in the teacher preparation program.

3. The collection of data on student performance, frequent feedback of this information, and the use of the data to identify areas in which the student teacher particularly needs to learn more.

Who Should be Allowed to Teach?

Evidence on ways to predict the probable success of prospective teachers is not very helpful in establishing criteria by which one might decide who should be certified by the teacher preparation program as being qualified to enter teaching. As we noted above, standardized tests like the ACT and SAT do not systematically predict teacher success. Neither do scores on the NTE although no research we uncovered deals with the predictiveness of the revised NTE now being used. Grade point averages are not consistently related to teacher effectiveness nor are pre-entry evaluations by college faculty, though the research on this last point is very limited.

Given the absence of reliable and valid ways of screening students before they enter teaching, perhaps the answer to the question of who should be allowed to teach is: those persons who complete the type of preparation program we are outlining here. One might have more confidence in such a simple answer if (a) the content of the courses and the evaluation of students were rigorous and (b) certification did not depend, for practical purposes, only on graduation from a teacher preparation program but required teachers to demonstrate competence on the job.

What Responsibility Should Teacher Education Programs Have for the Induction Period of Student Learning?

We have stressed the importance of the induction period of teaching to the effectiveness of teacher preparation programs. It follows, we think, that better teacher preparation programs would be seeking some ways to

foster teacher learning during the first year or two of full time teaching.

This review has focused on undergraduate teacher preparation but we see no reason why the lessons of this report could not be applied to programs that extend beyond the four years of undergraduate studies or that only admit students who have already earned the bachelor's degree.

We have examined a large number of studies that seem relevant to the identification of the characteristics of effective programs for training the nation's teachers. As the reader knows by now, empirical research is limited and tells us more about what not to do than about effective policies, programs, and practices.* But the research does give some direction and raises some questions about the efficacy of some of the most widely advocated current proposals for reforming teacher education.

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*It is very clear to us that the reform of teacher education would be facilitated by more and better research. In looking at the publication dates of studies that deal explicitly with the outcomes of teacher preparation programs, one is struck by the fact that very few of these studies have been done in the last ten years.

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